

COMP201: Software Engineering — Coursework

Autumn 2000 Term

A video rental store is about to develop an automated rental management system. The system is to be used by both store managers and by point-of-sale staff. The system will keep track of:

- Customers.
These are the customers of the store, who are eligible to rent videos. Each customer is identified by a unique customer id. For each customer, the system will keep track of their name and their address.
- Staff.
Staff in the video store are each identified by a unique id. Some of the staff are managers, and are able to perform privileged operations (see below).
- Videos in stock.
All the videos that are owned by the store. Each film is identified by a unique film code. There may be multiple copies of the same film in stock.
- Videos on loan.
The videos that are currently on loan. For each video on loan, the system will record the customer id and the date loaned.

The system is to allow the following operations to be carried out:

- Add details of a new film.
When a new film is released, details can be added to the video library. Notice that this is *not* the same as purchasing a copy of a video.
Only managers can do this.
- Add details of a new video.
When a copy of a video is purchased, the details must be added to the system. It is only possible to do this if the film of which the video is a copy is known to the system.
Only managers can do this.
- Remove a video.
When a worn-out video is thrown away, its details must be deleted from the system. Notice that reference to the video will be deleted – not the film itself.
Only managers can do this.

- Take a video out.

This is when a customer takes out a copy of a video from the store. Notice that a customer cannot take out a video that is already on loan.

Managers and other staff can do this.

- Return a video.

This is the act of returning a video to the store.

You are required to write a Z specification of this system — the state space and all operations described above.

Marks will be awarded as follows:

- 25% for the state space schema(s);
- 15% each for the five operations mentioned above.

You should ensure that you make any assumptions explicit, and you should include comments in English in order to make sense of the specification.

This coursework is worth 25% of the overall marks for the COMP201 module.

Deadline: Monday 4 December